

OUT 65889

6 SEP 68 21 48Z

TOP SECRET 062105Z SEP 68 CITE [REDACTED] 4537

PRIORITY [REDACTED]

CORONA

SUBJECT: DUPLICATE PROCESSING STUDY

REFERENCE: [REDACTED] 3130

25X1

25X1

25X1

1. THE 1102 PERFORMANCE EVALUATION TEAM REQUESTED THAT THIS FACILITY UNDERTAKE A STUDY TO ESTABLISH THE DEGREE OF INFORMATION LOSS FROM THE ORIGINAL NEGATIVE TO THE SECOND GENERATION DUPLICATE POSITIVE. THE MATERIAL USED FOR THIS EVALUATION WAS FROM MISSION 1102 BECAUSE IT WAS FELT THE IMAGERY OF THAT MISSION PRESENTED THE MOST CHALLENGE TO THE CAPABILITY OF THE PRESENT DUPLICATING SYSTEM.

2. THE EVALUATION IS DIVIDED INTO TWO PHASES, SUBJECTIVE AND OBJECTIVE. THE SUBJECTIVE PHASE CONSISTED OF READING AND EVALUATING ON BOTH THE NEGATIVE AND SECOND GENERATION POSITIVES, ALL RESOLUTION TARGETS IMAGED DURING THE MISSION, AND THE EVALUATION OF IMAGE QUALITY (INFORMATION CONTENT) IN CULTURAL AREAS. THE OBJECTIVE PHASE CONSISTED OF MAKING MICRODENSITOMETRIC EDGE TRACES ON BOTH THE ORIGINAL NEGATIVE AND THE DUPLICATE POSITIVE.

## A. SUBJECTIVE EVALUATION

## (1) MISSION 1102 PROVIDED COVERAGE OF TEN RESOLUTION

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TARGETS; HOWEVER, DUE TO VARIOUS REASONS SUCH AS CLOUD COVER, FORMAT LOCATION, ETC., ONLY SIX WERE SUITABLE FOR THE ANALYSIS. THE SIX TARGETS ARE:

PASS FRAME

DISTRIBUTION		
CY	OFFICE	PI
1	FILE	
2	CABLE SEC.	
	FP&B/RD	
	SECUR.	
3	TSSG	25X1
4/5	PSG/OC	
	RRD	
	REPRO	
	AID	25X1
	IEG	
	PROD	
	SCIEN	
	WEST	
	EAST	
	M&S	25X1
	PGM	
	IAS	25X1
	DIA-XX4	
	SPAD	
	DIA-AP	
	[REDACTED]	25X1
	CMX	

THE TARGETS WERE READ BY SEVEN PET MEMBERS AND BY SIX PERSONNEL. HOWEVER, NOT ALL PET MEMBERS READ ALL SIX TARGETS. THE [REDACTED] ANALYSTS DID READ ALL OF THE RESOLUTION TARGETS. THE MOST SIGNIFICANT PROBLEM WAS THE VARIATION IN READINGS BETWEEN OBSERVERS ON THE SAME TARGET. IN TWO INSTANCES THIS VARIATION REPRESENTS FIVE BAR GROUPS; FROM A LOSS OF FOUR BAR GROUPS (3'4") IN THE POSITIVE COMPARED TO THE NEGATIVE ACCORDING TO ONE OBSERVER, TO A GAIN OF ONE BAR GROUP (1'2") IN THE POSITIVE ACCORDING TO ANOTHER OBSERVER. THE FOLLOWING TABLE ILLUSTRATES THE GAIN OR LOSS OF BAR GROUPS ON THE POSITIVE COM-

ADVANCE CY  
SANITIZED  
WITH TEXT

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PARSED TO THE NEGATIVE AS A PERCENTAGE OF THE TOTAL OBSERVATIONS. ALSO PRESENTED IS A BREAKDOWN ON THE OBSERVATIONS MADE BY THE PET MEMBERS COMPARED TO THOSE OF THE [REDACTED] PERSONNEL.

	GAIN	LOSS	LOSS	LOSS	LOSS	LOSS
	OF	OF	OF	OF	OF	OF
BAR GROUP	1	0	1	2	3	4
PERCENT OF						
READINGS						
BY PET						
MEMBERS	0.0	36.9	24.7	13.8	15.4	9.2

35X1

25X1

25X1

GROUP 1  
Excluded from automatic  
downgrading and  
declassification

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PERCENT OF  
READINGS

BY [REDACTED]

25X1

ANALYSTS	7.1	47.3	27.2	13.6	3.6	1.2
TOTAL						

PERCENTAGE	5.1	44.5	26.5	13.7	6.8	3.4
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IN MOST CASES, AS THE FOREGOING TABLE INDICATES, A LOSS OF RESOLUTION NO GREATER THAN ONE BAR GROUP WAS NOTED. IN A FEW CASES (5.1 PERCENT) MORE BAR GROUPS WERE READ ON THE POSITIVE THAN ON THE ORIGINAL NEGATIVE.

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(2) CULTURAL AREAS WERE COMPARED IN THE DUO STAR SPLIT FIELD MICROSCOPE. A LOSS OF FINE DETAIL IN THE HIGHLIGHT AREAS AND TO A LESSER EXTENT IN THE SHADOW AREAS WAS NOTED ON SOME POSITIVES. THIS LOSS HOWEVER, APPEARS TO BE THE RESULT OF THE PRINT LEVEL THAT THE PARTICULAR FRAME RECEIVED AND THE CONTRAST OF THE AREA SELECTED FOR COMPARISON. CORRECTIVE PRINTING COULD AND DID PROVIDE MOST OF THE OTHERWISE MISSING DETAIL IN THE POSITIVE.

## B. OBJECTIVE EVALUATION

(1) MICRODENSITOMETRIC TRACES WERE MADE OF IDENTICAL EDGES ON THE ORIGINAL NEGATIVE AND THE DUPLICATE POSITIVE. THESE TRACES WERE HAND SMOOTHED AND SUPERIMPOSED FOR COMPARISON. THE SLOPES ON THE TRACES WERE IDENTICAL, INDICATING THAT A LOSS IN EDGE SHARPNESS COULD NOT BE DETECTED MICRODENSITOMETRICALLY.

## C. CONCLUSION AND OBSERVATIONS

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25X1

(1) THE REPRODUCTION OF THE ORIGINAL NEGATIVE IS CONSIDERED GOOD. THE MAJOR LOSS OF RESOLUTION WHETHER IN RESOLUTION TARGET READINGS OR IN HIGHLIGHT/SHADOW DETAIL APPEARS TO BE THE RESULT OF THE PRINTING LEVEL AND CONTRAST OF THE AREAS SELECTED FOR COMPARISON. IT SHOULD BE NOTED THAT FRAMES WITHIN A PASS ARE NOT PRINTED INDIVIDUALLY. THE PRINT LEVEL IS DICTATED BY A COMPROMISE OF THE BEST LEVEL FOR A NUMBER OF FRAMES.

(2) AN UNBIASED PHOTO INTERPRETER COMPARISON OF THE ORIGINAL NEGATIVE AND RESULTING POSITIVE IS EXTREMELY UNLIKELY. THE PSYCHOLOGICAL ADVANTAGE OF THE POSITIVE IMAGE OVER THAT OF THE NEGATIVE, SUPERSEDES SUBTLE INFORMATION CONTENT DIFFERENCES.

T O P S E C R E T

END OF MSG